

OSA -1591-66

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March 31, 1966

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Advanced Plans and Programs Office (ASZ-5)
Deputy for Systems Management
Headquarters, Aeronautical Systems Division
Wright-Patterson Air Force Base, Ohio

Subject: Contract AF33(600)40280 (WE 1000)
Submission of Monthly Status Report
(Westinghouse Reference DWD-45196)

Enclosure: (1) One (1) copy Progress Report for Period
1 February 1966 to 28 February 1966, dated
March 30, 1966

Gentlemen:

In accordance with the subject contract, we are forward-
ing the Progress Report for the period indicated.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION

R. W. Eby
Marketing Specialist
Research and Development
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Marketing Department

RWE/vr

cc: Technical Director
w/two copies of
Enclosure (1)

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PROGRESS REPORT

Period of

1 February 1966 to 28 February 1966

Contract Number AF33(600)40280

30 March 1966

BY

WESTINGHOUSE DEFENSE AND SPACE CENTER

AEROSPACE DIVISION

Box 746, Baltimore, Maryland 21203

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A. F-101 FLIGHT TEST

The departure of the F-101 on 3 February essentially completes this portion of the program. Only a small number of government supplied parts and spares remain to be returned to the Air Force.

B. SYSTEM

LOW NOISE RECEIVER PRE-AMPLIFIER

The second deliverable parametric amplifier was completed. Characteristics of the two par-amps are quite similar, as shown by the summary of measurements:

	Amplifier 001	Amplifier 002
Gain, peak	17 db	17 db
Bandwidth, Lower 1 db point	-65 MHz	-120 MHz
Upper 1 db point	+60 MHz	+100 MHz
Bandwidth, Lower 3 db point	-120 MHz	-150 MHz
Upper 3 db point	+100 MHz	+130 MHz
Noise Figure (Amplifier only)	3.2 db	3.2 db
Gain Sensitivity to Pump Power	19 db/db	21 db/db
Gain Sensitivity to Bias	0.1 db/mv	0.17 db/mv
Bias Voltage	0.8 v	0.57 v
Pump Power at 25 KMHz	140 mw	223 mw

Installed on the system frame, noise figure of amplifier 001 measured 5.5 db, including the losses of the circulator, TR tube, and waveguide. This unit has since been removed from the frame for a temperature test.

MODIFICATIONS

The October 1965 progress report summarized the status on the 23 minor modifications started at that time. Of these 23, 17 were listed as complete. Status of the 6 incomplete modifications, plus 5 additional started since October, is as follows:

	System Units Complete	System Units In Work	Spare Unit In Work
Recorder, Flip-Flop Redesign	3	0	
Low Noise Pre-Amplifier (Par-Amp)	2	1	
Transmitter, TWT Filament Switching	3	0	
Transmitter, TWT Overload Circuit	2	1	
Recorder, ABC and Light Meter	3	0	
Recorder, Aluminum Rollers	2	0	
Recorder Inverter, High Ground Speed Limiter	3	0	
Range Mark Generator, Level Adjust	1	2	1
Power Supply, 5 minute Time Delay	0	3	
Stalo, Phase Detector Gain Reduction	0	3	1
Single Axis Platform, Connector Change	0	3	

Five of these modifications are now complete as shown above. Recorder 006, assigned to system 001 and expected to remain in Baltimore, was not changed to aluminum rollers. No difficulty is expected with this recorder if the film drive tests performed previously on the F-101 before take-off are continued.

Much of the work on the incomplete modifications has been done. The last par-amp required has been fabricated, but a temperature test needs to be performed before installation on the frame. Addition of the TWT overload circuit on the breadboard

transmitter has not been started simply because of the low priority rating on this item. A level adjustment for range mark amplitude was found to be desirable on the F-101 flight test to compensate for the different amplitude of video required by each cathode ray tube. This simple change will be made on all units.

The last three modifications are not complete because parts on order have not been received. The five minute time delay for the transmitter is being changed from a thermal delay to a solid state delay to give more reliability. Two precision resistors have not been received for the stato improvement. After they arrive, stability tests on the unit must be run. Connectors and "Transit Heet" cans are required before continuing work on the S. A. P. modification.

All of this work is expected to be completed by the first of June. Only the S. A. P. connector change would prevent use of the radar equipment immediately if required for field operation. This change was just authorized the last week in February.

No additional modifications are planned on the radar at this time.

A microscope has been received which allows checking the recorder focus at the capstan. Recorder mirrors can be adjusted more easily for best focus on the primary film.

ANTENNA

R-f tests on antenna 002 showed a VSWR outside specified limits. A three stub tuner has been fabricated and installed on the power dividers. Tests on the power divider system alone indicate satisfactory VSWR. After resealing the power dividers and assembling on the antenna, the antenna VSWR will be retested.

All sticks of four modules of antenna 003 have been bonded. The sticks of the other two modules have been prepared for bonding. All sticks for antenna 003 and the spare modules will be bonded before assembly of any module is started.

C. SPARES

No items were added to the spares list in February. Since spares have been up-dated for the modifications and improvement, no further items are planned to be added to the spares exhibit. Amendment 12 is therefore closed out. Delivery status of the system spares is as follows:

	Items Shipped	Items Open	Per Cent Complete
Full Spares List	4	13	99
Basic List plus first 10 amendments	0	7	99
Amendment 11	2	5	64
Amendment 12	2	1	83

A review of the 13 items shows little work remaining in this spares phase. Six items are the spare antenna array modules, being rebonded on negotiation J0194-66 and scheduled for completion by 1 September 1966. Three items have been received

and are ready for packaging and delivery. Three items are parts for the transmitter cooling ordered on one purchase order, which is two months overdue but expected shortly. One item is the photo-cell bracket assembly, which is fabricated but not tested. No difficulty is expected in the completion of any of these spares.

D. CORRELATOR OPERATION

After reviewing several proposals, a sub-contract was let to the Simco Company to install a dust removing system in the correlator. This system consists of static eliminating bars, hood and brush assemblies, and vacuum to eliminate static and dust from both sides of the primary film. The unit should be ready for installation in April. Some minor modification to the correlator is required to install. The cost for this system was included in negotiation J0194-66 task 4 authorized and funded on 17 March 1965.

Some calculations were made of the effect on azimuth resolution of reducing the recorder swath width for the field flight altitude. Halving the swath width would improve range resolution from 23 feet to 17 feet, assuming the 30 nanosecond transmitted pulse width is used. The half recorder swath reduces the recorded data from 22 to 11 nautical miles ground range, although either half may be selected prior to take-off. Azimuth resolution at the center of each half sweep width would be little affected by the change. However, the azimuth resolution at the edges of each sweep would be approximately 1.6 times normal, if the present wedge interference filters in the correlator were

used. New filters to match the new recorder sweep speed would reduce average azimuth resolution at the sweep edges from 42 feet with the present correlator to 27 feet. This average of 27 feet at the sweep edges is due primarily to the field curvature of the correlator and exists even with the correlator used with the full recorder swath.